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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/098,832	06/17/1998	JARI HAMALAINEN	442-008040-U	4557

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EXAMINER	
PHAN, MAN U	
ART UNIT	**PAPER NUMBER**
2665	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/098,832	HAMALAINEN ET AL.	
	Examiner	Art Unit	
	Man Phan	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment and argument

1. This communication is in response to applicant's 07/06/2004 Amendment in the application of Hamalainen et al. for a "Time division multiple access radio systems" filed 06/17/1998. This application claims foreign priority based on the application 972724 dated 06/24/1997 filed in Finland. This application is a Continued Prosecution Application (CPA) filed on March 14, 2003. The proposed amendments have been entered and made of record. Claims 1-10 are pending in the application.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C.103 as discussed below. Applicant's argument with respect to the rejected claims have been fully considered, but they are not persuasive for at least the following reasons.

3. Applicant asserts that there is no motivation to combine the prior art as proposed in the office action, Crisler et al. (US#5,594,738) and Dent (US#5,757,787), i.e. In response, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Crisler et al. are

applied herein merely for the teaching of a method for allocating time slots in a time division multiple access (TDMA) communication system 100, in which time slot allocator (101) transmits an allocation indication to the communication unit in each of N downlink time slots (110) corresponding to the N allocated uplink time slots (108) to inform the communication unit (102) of the allocation. In the same field of endeavor, Dent discloses an adaptive time division multiple access format for transmitting traffic and signalling data between a network station and a plurality of remote stations utilizing asymmetric TDMA frames in uplink and downlink traffic.

4. On page 5, third paragraph, Applicant's argument that the rejected claims 1, 2, 5-7 that prior art does not teach "*asymmetric TDMA time frames which contain asymmetric downlink and uplink traffic channel*" However, Dent discloses an adaptive time division multiple access format for transmitting traffic and signalling data between a network station and a plurality of remote stations, in which asymmetrical TDMA formats in which uplink TDMA formats can have a smaller number of timeslots combined with a greater availability of narrower bandwidth frequency channels than the corresponding downlink TDMA formats (*allocating a greater number of time slots in each downlink TDMA frame than in each uplink TDMA frame*), thus reducing the peak-to-mean power ratio needed in the mobile terminal (Col. 1, lines 62 plus). Fig. 6 shows the correspondence between up and downlink frequencies and timeslots, in which the uplink comprises 4 timeslots on each of four 50 KHz channels in 1:1 association with 16 timeslots on one 200 KHz downlink channel. The incorporated invention provides a nominally constant time-

duplex spacing between transmit and receive for all channels, which is useful in simplifying the design and operation of the mobile phone (Col. 15, lines 39 plus).

According to the current GSM recommendations, three time slots out of eight are reserved for transition from transmission to reception and vice versa. Mobile stations belonging to class 1 are not capable of simultaneous uplink and downlink data transmission, and consequently at most five time slots can be allocated to them (uplink+downlink), and usually *more time slots are allocated asymmetrically to the downlink than to the uplink.* Mobile stations of class 2 are capable of simultaneous transmission and reception, and thus even 16 time slots (8 uplink+8 downlink) can be allocated to them at the same time. In that case the maximum data rate in one direction may be 76.8 kbps out of which the maximum amount of payload is 64 kbps. In the GSM-based high-speed circuit-switched data service - HSCSD - there are also 18 multislot classes which are used for defining the desired number of time slots for the connection and for dividing the time slots into uplink and downlink time slots. Multislot classes 1 to 12 are reserved for mobile stations of class 1, and multislot classes 13 to 18 for mobile stations of class 2. In the HSCSD system billing is based on the time slots used on the connection, i.e. it is directly comparable to the desired bit rate. The HSCSD system is described in greater detail is GSM specifications 02.34 and 03.34. It's noted that, in accordance with the "frame-based" approach in the mobile communication system based on TDMA, communication channels are configured to have either symmetric or asymmetric uplink/downlink bandwidths depending upon the needs of the channel. Channel bandwidth asymmetry can be configured alternatively in favor of the uplink transmissions (i.e., more time slots are

allocated for uplink transmissions than for downlink transmissions) or in favor of the downlink transmissions (i.e., more time slots are allocated for downlink transmissions than for uplink transmissions). Therefore, examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-2 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crisler et al. (US#5,594,738) in view of Dent (US#5,757,787).

With respect to claims 5-7, both Crisler et al. (US#5,594,738) and Dent (US#5,757,787) disclose a novel method and system for allocating time slots in a TDMA communication system according to the essential features of the claims. Crisler discloses an effective channel allocation technique in a TDD-TDMA based network employing separate TDM downlink/uplink channels (*symmetric TDMA time frames which contains symmetric downlink and uplink traffic channel*). Crisler teaches in Fig. 1 illustrated a TDMA communication system 100 that includes a time slot allocator 101. The communication unit 102 transmits information to the base stations via an uplink TDM channel 106 and receives information from the base stations via a downlink TDM channel 113 separately (*symmetric TDMA time frames which contains symmetric downlink and uplink traffic channel*). Uplink time slots (108) may be allocated within a communication system (100) when a communication unit (102) transmits a first packet (501) to a time slot allocator (101). Upon receiving the first packet (501), the time slot allocator (101) determines whether the first packet (501) contains a request for allocation of N uplink time slots. When the first packet (501) contains the request for allocation of N uplink time slots, the time slot allocator (101) allocates the N uplink time slots to the communication unit (102) when the N uplink time slots are available, wherein the N uplink time slots are allocated contiguous in time. The time slot allocator (101) then transmits an allocation indication to the communication unit in each of N downlink time slots (110)

corresponding to the N allocated uplink time slots (108) to inform the communication unit (102) of the allocation (Col. 3; lines 25 plus).

However, Crisler does not expressly disclose the asymmetric TDMA time frames allocation in uplink and downlink traffic channels. In the same field of endeavor, Dent (US#5,757,787) discloses *asymmetrical TDMA formats* in which uplink TDMA formats can have a smaller number of timeslots combined with a greater availability of narrower bandwidth frequency channels than the corresponding downlink TDMA formats (*a greater number of time slots may be allocated in each downlink TDMA frame than in each uplink TDMA frame*), thus reducing the peak-to-mean power ratio needed in the mobile terminal . When practicing the invention disclosed in the above incorporated application however, a terminal is not capable of being compatible with the GSM cellular standard's uplink waveform (See Fig. 2; Col. 1, lines 62 plus and Col. 24, lines 26 plus). It is well recognized that for transmitting control information, the control channels can be arranged in a variety of ways. If there are more time-slots available in the downlink direction than in the uplink direction, it is possible that all the downlink time-slots are used for transmitting control information, whereas in the uplink direction, control information is transmitted e.g. in one time-slot only. In such a case, one uplink time-slot forms control channel pairs with several downlink time-slots.

Regarding claims 1-2, they are method claims corresponding to the apparatus and system claims 5-7 above. Therefore, claims 1-2 are analyzed and rejected as previously discussed with respect to claims 5-7.

One skilled in the art would have recognized the need for efficiently providing a method and system for allocating of time slots in uplink/downlink TDMA frames using half duplex, and would have applied Dent's novel use of the TDMA frames for uplink and downlink in an asymmetric allocation of time slots into Crisler's teaching of the time slot allocator in a TDMA communication system. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Dent's Dual mode satellite/cellular terminal into Crisler's time slot allocation method with the motivation being to provide a system and method for channel allocation in a telecommunications with asymmetric uplink and downlink traffic channels in a TDD-TDMA based network.

8. Claims 3-4 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crisler et al. (US#5,594,738) in view of Dent (US#5,757,787) as applied to the claims above, and further in view of Galyas et al. (US#6,205,157).

With respect to the claims 8-9, these claims differ from claims above in that the claims require wherein the TDMA radio system utilizes the GPRS and HSCSD protocols. The standards High Speed Circuit Switched Data (HSCSD) and Global Packet radio Services (GPRS) have been introduced in the GSM standard to enable connections with higher transmission rates. HSCSD and GPRS connections use a multislot configuration of channels for transmitting data, that is, one connection is allowed to occupy more than one channel, that is, more than one time slot in each frame. Currently, the Global System for Mobile Communication (GSM) based PCS systems operate at 1900 MHZ, and support only up to a rate of 9.6 Kbps for data

transfer. Higher rate wideband applications are constantly being sought after to meet the ever growing demand of wireless communication services. Accordingly, High Speed Circuit Switched Data (HSCSD) and General Packet Radio Services (GPRS) are being standardized to accommodate this grave need. In the same field of endeavor, Galyas (US#6,205,157) teaches in Fig. 3 illustrated in more detail, the transport network 45 between the mobile station 15, base transceiver station 30 and interworking function 40 or PCU 46. With the further development of user applications within a public land mobile network (PLMN), a number of high capacity non-speech data services have been introduced. Such services include all circuit-switched data services as defined in TSGSM02.02 and TSGSM02.03, as well as other GSM phase 2+services, including facsimile transmission, high-speed circuit-switched data (HSCSD), high-speed modem connections, and general packet radio services (GPRS). As a result, a telecommunications module known as an interworking function (IWF) 40 has been developed to enable the transmission and protocol adaptation from one telecommunications network, such as a connected PSTN 50, to the serving PLMN. The IWF 40 may be co-located with a particular mobile switching center (MSC) serving a designated geographic area or may be implemented as a separate telecommunications node. The IWF 40 is connected to a transcoder/rate adapter unit (TRAU) 55. The TRAU 55 is further connected to a number of base transceiver stations (BTS) 30 providing radio coverage for mobile stations 15 located within the serving MSC coverage area (Col. 3, lines 31 plus).

Regarding claims 3-4 and 10, they are method claims corresponding to the apparatus and system claims 8-9 above. Therefore, claims 3-4, 10 are analyzed and rejected as previously discussed with respect to claims 8-9.

One skilled in the art would have recognized the need for efficiently providing a method and system for allocating of time slots in uplink/downlink TDMA frames using half duplex, and would have applied Galyas's delays generated within a GPRS, HSCSD, Dent's novel use of the TDMA frames for uplink and downlink in an asymmetric allocation of time slots into Crisler's teaching of the time slot allocator in a TDMA communication system. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Galyas' method for propagation delay control and Dent's novel use of the TDMA frames for uplink and downlink in an asymmetric allocation of time slots into Crisler's teaching of the time slot allocator in a TDMA communication system. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Galyas'Method for propagation delay control and Dent's Dual mode satellite/cellular terminal into Crisler's time slot allocation method with the motivation being to provide a system and method for channel allocation in a telecommunications with asymmetric uplink and downlink traffic channels in a TDD-TDMA based network.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Hamalainen et al. (US#5,729,541) is cited to show the system for transmitting packet data in radio telephone TDMA systems.

The Hamalainen et al. (US#5,640,395) is cited to show the system for transmitting packet data in digital cellular TDMA air interface.

The Kanerva et al. (US#6,240,076) is cited to show the asymmetric high speed data transmission apparatus and method in a mobile communications network.

The Mujtaba (US#6,813,254) is cited to show the methods and apparatus for wireless communication using code division duplex time slotted CDMA.

The Papadopoulos et al. (US#5,594,720) is cited to show the multiple access cellular communication with dynamic slot allocation and reduced co-channel interferences.

The Eriksson et al. (US#5,521,904) is cited to show the methods and apparatus for testing a base station in a TDMA radio communications system.

The Klein et al. (US#6,804,211) is cited to show the frame staructure for an adaptive modulation wirelerss communication system.

The Menzel et al. (US#6,614,777) is cited to show the process and base station system for configuring an air interface between a mobile station and a base station in a time division multiplex mobile radio telephone system for packet data transmission.

The Allpress et al. (US#6,744,778) is cited to show the TDMA communication system.

The Ahmavaara (US#6,747,966) is cited to show the radio system and methods for duplex operation.

The Okajima et al. (US#6,819,661) is cited to show the methods and apparatus for a mobile communication system which reduces power consumption by observing only the starting slot on a TDMA radio channel.

The Jamal (US#5,754,537) is cited to show the methods and system for transmitting background noise data.

10. **THIS ACTION THIS ACTION IS MADE FINAL.** See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached on Mon - Fri from 6:00 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone

number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

11. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231 **or faxed to:** (703) 305-9051, (for formal communications intended for entry) **Or:** (703) 305-3988 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Mphan

12/08/2004